VUMC NEWS

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Vanderbilt University Medical Center and AstraZeneca join forces to identify potential COVID-19 treatments

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By: Bill Snyder

Vanderbilt University Medical Center and the global biopharmaceutical company AstraZeneca have joined forces to identify candidates for antibody-based treatments that could protect people exposed to the 2019 novel coronavirus disease, COVID-19.

Under a recently signed agreement, genetic sequences for antibodies discovered in the Vanderbilt Vaccine Center (VVC) will be provided to AstraZeneca for identification of the most promising candidates for clinical assessment and future clinical use.

The goal is to develop antibodies that could be given to people infected with SARS-CoV-2, the virus that causes COVID-19, to reduce the severity of their illness and speed recovery. The agreement with AstraZeneca allows VVC to continue working with other partners to develop antibodies for diagnostic and therapeutic applications.

“AstraZeneca is a great partner for us, since we have ultra-rapid antibody discovery technologies and have already discovered SARS-CoV-2 neutralizing antibodies,” said VVC Director James Crowe Jr., MD. “AstraZeneca has world-class

product development and manufacturing expertise that could, if successful candidates are identified, turn these antibodies into effective biological drugs quickly."

Mene Pangalos, Executive Vice President, BioPharmaceuticals R&D, AstraZeneca said: "Through our scientific expertise in infectious disease and antibody discovery and development, we have rapidly mobilized our research efforts to help respond to the COVID-19 global pandemic. By partnering with institutes such as the Vanderbilt University Medical Center, we aim to accelerate the discovery and development of a safe and effective antibody treatment to prevent COVID-19."

There currently is no effective treatment or vaccine to stop the spread of SARS-CoV-2, which as of April 8 had infected more than 1.4 million people worldwide and caused more than 83,000 deaths.

VVC researchers have developed techniques for rapidly isolating clones of antibody-producing white blood cells that produce antibodies targeting specific viral proteins. In the laboratory, these "monoclonal" antibodies are then comprehensively examined to identify those rare antibodies with a laser-like focus for finding — and neutralizing — a specific virus.

Using these techniques, they have generated human monoclonal antibodies against a wide range of pathogenic viruses including Ebola, chikungunya, HIV, dengue, norovirus and respiratory syncytial virus (RSV). They have pioneered the rational design of neutralizing antibody treatments and vaccines, some of which have progressed to clinical trials.

For the past several weeks, Crowe, Associate VVC Director Robert Carnahan, PhD, and their colleagues have been working around the clock with an international team of academic, governmental and corporate partners to identify and analyze antibodies against SARS-CoV-2.

They have now identified antibodies capable of neutralizing the virus and are rapidly selecting the best candidates for moving forward towards clinical development.

Crowe holds the Ann Scott Carell Chair in the Departments of Pediatrics and Pathology, Microbiology and Immunology. Carnahan is associate professor of Pediatrics

Others in the VVC who are crucial to the effort are:

Senior staff scientist Pavlo Gilchuk, PhD, research fellow Seth Zost, PhD, staff scientist Naveen Suryadevara, PhD, senior research specialist Nurgun Kose, research assistants Rachel Sutton, Joe Reidy, Andrew Trivette and Erica Armstrong, lab managers Rachel Nargi and Ryan Irving, applications developer Taylor Jones and project managers Merissa Mayo and Ginger DeBellis.

Major funding sources for the VVC include DARPA, the Defense Advanced Research Projects Agency of the U.S. Department of Defense and the National Institute of Allergy and Infectious Diseases, part of the National Institutes of Health (NIH).